

	A	B	C	D	E	F	G	H	I	J	K	L
1				Gamma Background Statistics for Data Sets with Non-Detects								
2	User Selected Options											
3	Date/Time of Computation			8/2/2013 10:59:30 AM								
4	From File			WorkSheet.xls								
5	Full Precision			OFF								
6	Confidence Coefficient			95%								
7	Coverage			95%								
8												
9	DDx											
10												
11	General Statistics											
12	Total Number of Observations				46	Number of Distinct Observations				46		
13	Number of Detects				44	Number of Non-Detects				2		
14	Number of Distinct Detects				44	Number of Distinct Non-Detects				2		
15	Minimum Detect				0.461	Minimum Non-Detect				0.94		
16	Maximum Detect				6.695	Maximum Non-Detect				0.98		
17	Variance Detected				1.233	Percent Non-Detects				4.348%		
18	Mean Detected				2.141	SD Detected				1.111		
19	Mean of Detected Logged Data				0.639	SD of Detected Logged Data				0.515		
20												
21	Critical Values for Background Threshold Values (BTVs)											
22	Tolerance Factor K (For UTL)				2.079	d2max (for USL)				2.924		
23												
24	Gamma GOF Tests on Detected Observations Only											
25	A-D Test Statistic				0.585	Anderson-Darling GOF Test						
26	5% A-D Critical Value				0.753	ected data appear Gamma Distributed at 5% Significance Level						
27	K-S Test Statistic				0.109	Kolmogrov-Smirnoff GOF						
28	5% K-S Critical Value				0.134	ected data appear Gamma Distributed at 5% Significance Level						
29	Detected data appear Gamma Distributed at 5% Significance Level											
30												
31	Kaplan Meier (KM) Background Statistics Assuming Normal Distribution											
32	Mean				2.08	SD				1.112		
33	95% UTL95% Coverage				4.392	95% KM UPL (t)				3.968		
34	95% KM Chebyshev UPL				6.98	90% KM Percentile (z)				3.505		
35	95% KM Percentile (z)				3.909	99% KM Percentile (z)				4.667		
36	95% KM USL				5.332							
37												
38	Gamma Statistics on Detected Data Only											
39	k hat (MLE)				4.235	k star (bias corrected MLE)				3.962		
40	Theta hat (MLE)				0.506	Theta star (bias corrected MLE)				0.54		
41	nu hat (MLE)				372.7	nu star (bias corrected)				348.6		
42	MLE Mean (bias corrected)				2.141							
43	MLE Sd (bias corrected)				1.076	95% Percentile of Chisquare (2k)				15.4		
44												
45	Gamma ROS Statistics using Imputed Non-Detects											
46	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
47	GROS may not be used when kstar of detected data is small such as < 0.1											
48	For such situations, GROS method tends to yield inflated values of UCLs and BTVs											
49	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
50	Minimum				0.461	Mean				2.077		
51	Maximum				6.695	Median				2.064		
52	SD				1.127	CV				0.543		
53	k hat (MLE)				3.795	k star (bias corrected MLE)				3.562		
54	Theta hat (MLE)				0.547	Theta star (bias corrected MLE)				0.583		
55	nu hat (MLE)				349.2	nu star (bias corrected)				327.7		
56	MLE Mean (bias corrected)				2.077	MLE Sd (bias corrected)				1.101		
57	95% Percentile of Chisquare (2k)				14.25	90% Percentile				3.553		
58	95% Percentile				4.154	99% Percentile				5.446		
59	The following statistics are computed using Gamma ROS Statistics on Imputed Data											
60	Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods											
61					WH	HW					WH	HW
62	Approx. Gamma UTL with 95% Coverage				4.881	5.016	95% Approx. Gamma UPL				4.19	4.26

	A	B	C	D	E	F	G	H	I	J	K	L	
63	95% Gamma USL				6.67	7.043							
64													
65	The following statistics are computed using gamma distribution and KM estimates												
66	Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods												
67					k hat (KM)	3.496						nu hat (KM)	321.7
68					WH	HW						WH	HW
69	Approx. Gamma UTL with 95% Coverage				4.831	4.961	95% Approx. Gamma UPL					4.155	4.222
70	95% Gamma USL				6.58	6.939							
71													
72	Note: The use of USL to estimate a BTV is recommended only when the data set represents a background												
73	data set free of outliers and consists of observations collected from clean unimpacted locations.												
74	The use of USL tends to provide a balance between false positives and false negatives provided the data												
75	represents a background data set and when many onsite observations need to be compared with the BTV.												
76													